# 2.4 Deductive Reasoning

Biconditional Statement--conjuction of a conditional and its converse

iff "if and only if"

Example:
If a quadrilateral has 4 right angles, then it is a rectangle.
If a quadrilateral is a rectangle, then it has 4 right angles

A quadrilateral has 4 right angles iff it is a rectangle.

Oct 2-11:00 AM

Deductive Reasoning--use facts, rules, definitions, or properties to reach logical conclusions

Oct 2-11:04 AM

Example:
If 2 angles are vertical, then they are congruent.

a. Given: $\angle 1$ and $\angle 2$ are vertical

Conclusion: $\angle 1 \cong \angle 2$

b. Given: $\angle 1 \cong \angle 2$

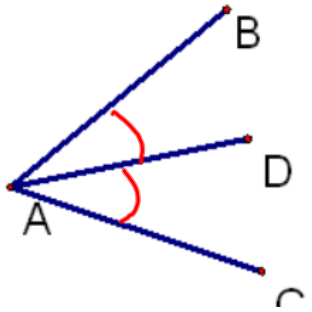
Conclusion: No concl.

Oct 2-11:11 AM

Example:
If a ray bisects an angle, then it divides it into $2 \cong \angle s$.

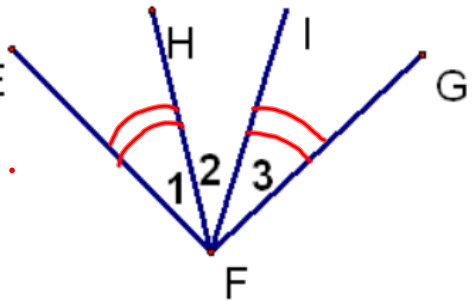
a. Given: $\overrightarrow{AD}$ bisects $\angle BAC$

Conclusion: $\angle BAD \cong \angle DAC$




b. Given: $\angle 1 \cong \angle 3$

Conclusion: No concl.




Oct 2-11:22 AM

Example:
If a figure is a rectangle, then opposite sides are congruent.

a. Given: ABCD is a rectangle
Conclusion: $\overline{DC} \cong \overline{AB}$, $\overline{DA} \cong \overline{CB}$


b. Given: MNOP is a valid trapezoid
Conclusion:

No concl.

c. Given: Figure RSTU; RS = TU, ST = RU
Conclusion:

No concl.


Oct 2-11:24 AM

Examples of Law of Detachment
Law of Detachment--If p→q is true, and p is true then q is true.

Translation: If p→q is true, and you are given p, then the conclusion is q.

$[p \to q \wedge p] \to q$

Oct 2-11:26 AM

Different type of reasoning.

Example:
Given: $\overline{WX} \cong \overline{UV}$; $\overline{UV} \cong \overline{RT}$

Conclusion: $\overline{WX} \cong \overline{RT}$

Oct 2-11:34 AM

Example:
(1) If Casey gets to bat, then he will get a hit.

(2) If Casey gets a hit, then we will win the game.

(3) If Casey gets to bat, then we will win the game.

Oct 3-9:51 AM

These are examples of the Law of Syllogism

If p q, and q r are true, then p r is true. 

Oct 3-9:53 AM

Open books to page 84

Oct 3-9:56 AM

# HW

p85-86 #s 12-29

p81 #1

Oct 3-9:56 AM